

REMARKS

In view of the above amendments and the following remarks, reconsideration of the objections and rejections set forth in the Office Action of January 28, 2008 is respectfully requested.

In order to make necessary editorial corrections, the entire specification and abstract have been reviewed and revised. As the revisions are quite extensive, the amendments to the specification and abstract have been incorporated into the attached substitute specification and abstract. For the Examiner's benefit, a marked-up copy of the specification indicating the changes made thereto is also enclosed. No new matter has been added by the revisions. Entry of the substitute specification is thus respectfully requested.

In item 1 of the Office Action, the Examiner objected to claim 1 due to an informality. However, independent claim 1 has now been amended as indicated above. In view of these amendments, it is respectfully submitted that the Examiner's objection to claim 1 has been overcome.

In the outstanding Office Action, the Examiner rejected all of the previously-pending claims in view of the prior art. In particular, the Examiner asserted that claims 18-21, 27-30, and 32 are anticipated by the Olgado reference (US 2002/0096436); and rejected the remaining claims as being unpatentable over the Olgado reference in view of the one or more of the Bonga reference (USP 3,588,196); the Moore reference (US 2003/0226764); the Hafeman reference (USP 5,164,319); and the Bernard reference (US 2003/0106845). However, the claims have now been amended as indicated above. For the reasons discussed below, it is respectfully submitted that the amended claims are clearly patentable over the prior art of record.

As an initial matter, the Applicants note that the Examiner applied the Bernard reference in rejecting several of the claims, but did not list the Bernard reference on the Form 892 attached to the Office Action. Therefore, the Examiner is respectfully requested *to list the Bernard reference on a Form 892* in the next communication so as to make the Bernard reference formally of record in this application.

A discussion of the present invention, including the features and advantages of the amended claims, will now be provided with reference to various portions of the present application. However, reference to any particular portions of the application is provided only for

illustrative purposes, and is not intended to otherwise limit the scope of the claims to any particular embodiments.

Independent Claim 1

The electrolytic processing apparatus recited in amended independent claim 1 is illustrated in Figures 6 and 7 and discussed on page 28, lines 1-14 of the original specification. In particular, as illustrated in Figure 7, an electrode base 62 has a *plurality of electrode members 60 for contacting and processing a surface of a substrate W* in the presence of a liquid to effect processing of the substrate W. A support base 70 floatingly supports the electrode base 62 by a floating mechanism 72.

As a result of the apparatus recited in amended independent claim 1, the electrode base can be tilted due to the force applied by the substrate W. Thus, the electrode members 60 can achieve contact with the substrate W more uniformly over a wider area of the substrate W than conventional processing apparatuses. This allows the contact pressure between the electrode members and the substrate W to become equalized (see page 28, lines 15-25 of the original specification).

The Olgado reference teaches an anode 16 that is secured within an anode base 2290 by anode supports 2294 (see paragraph [0036]). However, as acknowledged by the Examiner, the Olgado reference does not teach or suggest a support base that floatingly supports an electrode base by a floating mechanism. In addition, the Olgado reference does not teach a *plurality of electrode members*, as required in amended independent claim 1. Finally, the single electrode member (anode) 16 of the Olgado reference does not contact substrate 221 held by substrate holder 14 (see shoulder formed in inside surface of wall of electrolyte cell 2212 which prevents substrate 221 from being lowered to the anode 16, and lower surface of electrolyte cell 2212 which prevents anode 16 from being raised to the substrate 221).

Nonetheless, the Examiner asserted that the Bonga reference teaches hydrostatic bearings 8a and 9a (which correspond to the floating mechanisms) for positioning an electrode base 6. In this regard, the Bonga reference does, in fact, teach a rod 7 and piston 6 operated by a fluid mechanism so as to advance and retract an electrode tool 11 with respect to a workpiece 12 (see column 3, lines 1-10). However, the Bonga reference clearly teaches that the piston 6 and rod member 7 are operated to automatically maintain *an appropriate gap* between the working face

of the electrode tool 11 and the machining surface of workpiece 12 (see column 3, lines 60-65). Thus, the Bonga reference does not teach or even suggest a electrode base provided with *a plurality of electrode members for contacting and processing* a surface of the substrate.

Although the Examiner applied the Moore reference as teaching a plurality of electrodes 20a, 20b as shown in Figure 2, each of the electrodes 20a, 20b of the Moore reference contacts a separate, individual substrate 10 (see paragraph [0008] on page 1, and Figure 2). Thus, the Moore reference also does not teach or suggest *a plurality of electrode members for contacting and processing a surface of a substrate held by a substrate holder* (i.e., the electrode members contact the *same* substrate), as recited in amended independent claim 1. Thus, the advantages of achieving an equalized contact pressure between the electrode members and the substrate W cannot be achieved.

Because the remaining Hafeman reference and the Bernard reference also do not teach or even suggest the features recited in amended independent claim 1, it is respectfully submitted that amended independent claim 1 and the claims that depend therefrom are clearly patentable over the prior art of record.

Independent Claim 8

As illustrated in Figures 9 through 11, amended independent claim 8 is directed to an electrolytic processing apparatus that comprises *a plurality of electrode members for contacting and processing a surface of a substrate* held by a substrate holder in the presence of a liquid to effect processing of the substrate. Thus, for reasons similar to those discussed above with respect to amended independent claim 1, it is submitted that amended independent claim 8 is clearly distinguishable from the prior art of record.

In addition, amended independent claim 8 further recites *a plurality of electrode support bases*, each of the electrode support bases floatingly supporting *a respective one of the electrode members 64 by a floating mechanism 91* (see page 39, line 16 through page 40, line 5 of the original specification). As explained on page 40, lines 6-16 of the original specification, this additional feature allows the pressure between the electrode members and the substrate to be equalized even if the individual electrode members have different sizes, or if the surface of the substrate is uneven. As noted above, the Moore reference teaches a plurality of electrodes 20a, 20b each for contacting a *separate* substrate. However, the combination of prior art references,

including the Moore reference, does not teach or suggest *a plurality of electrode support bases*, in which each of the support bases floatingly supports *a respective one of the electrode members by a floating mechanism*, as now recited in amended independent claim 8. Thus, in addition to the distinctions discussed above with respect to amended independent claim 1, it is submitted that amended independent claim 8 is further distinguishable for the reasons discussed above.

Independent Claim 15

As also illustrated in Figures 9 and 10, amended independent claim 15 is directed to an electrolytic processing apparatus that comprises a plurality of electrode members *for contacting and processing a surface of a substrate* held by a substrate holder in the presence of a liquid to effect processing of the substrate. Therefore, for the reasons discussed above with respect to amended independent claim 1, it is respectfully submitted that amended independent claim 15 is clearly distinguishable from the prior art of record.

In addition, amended independent claim 15 further recites that the processing apparatus includes a floating mechanism 72 for floatingly supporting the electrode members 60, and an adjustment member for floating *a part of the plurality of electrode members selectively or changing the elasticity, which is generated by the floating mechanism, of a part of the plurality of electrode members* (see page 43, line 29 through page 44, line 15 of the original specification). As a result of these features, processing of the substrate can be conducted while allowing the electrode members to contact the substrate with low elasticity (i.e., a low modulus of elasticity) so that interfacial pressure between the electrode members and the substrate is low (see page 12, lines 21-26 of the original specification).

The Examiner asserted that the Moore reference teaches a plurality of electrodes 20a, 20b. However, as noted above, the electrodes 20a, 20b of the Moore reference each individually contact a *separate* substrate. However, the Moore reference does not teach or even suggest an adjustment member for floating a part of the plurality of electrode members selectively or changing the elasticity, which is generated by the floating mechanism, of a part of the plurality of electrode members, in which the electrode members contact and process the surface of *a* substrate. In fact, the Moore reference does not teach or suggest any floating mechanism or adjusting member for supporting or adjusting the support of a plurality of electrode members. Furthermore, none of the remaining prior art references of record teach or suggest a floating

mechanism and an adjustment member as recited in amended independent claim 15. Because none of the remaining prior art references teach or suggest a floating mechanism and adjustment member for floating a part of a plurality of electrode members, it is respectfully submitted that amended independent claim 15 and the claims that depend therefrom are clearly patentable over the prior art of record.

Independent Claims 23 and 25

As described on page 30, line 27 through page 31, line 16 of the original specification and illustrated in, for example, Figure 6, each of amended independent claims 23 and 25 is directed to an electrolytic processing method that comprises *bringing a substrate into contact with a floatingly-supported electrode member* in the presence of a liquid. In addition, while the substrate is in contact with the electrode member in the presence of the liquid, the method further comprises *moving the substrate and the electrode member relative to each other*, thereby processing the surface of the substrate.

Although the Examiner asserted that the Olgado reference teaches a method in which a substrate holder is brought into contact with an electrode base, the Olgado reference does not teach or suggest *bringing a substrate into contact with an electrode member*, as recited in amended independent claims 23 and 25 (as also noted above with respect to amended independent claim 1). Furthermore, as also noted above with respect to amended independent claim 1, the Bonga reference also does not teach or even suggest bringing a substrate into contact with an electrode member (see column 3, lines 60-65 of the Bonga reference).

Furthermore, in the outstanding Office Action, the Examiner asserted that the Olgado reference teaches “moving of the assembly, 14 via an arm in the vertical direction,” and referred to Figures 3a and 3b of the Olgado reference (see page 7 of the Office Action). However, it is not seen how the vertical movement of the substrate can be performed while the substrate is contacting the electrode member without damaging the substrate. In fact, it is submitted that the Olgado reference and the Bonga reference, either alone or in combination, do not teach or suggest moving the substrate and the electrode member relative to each other *while the substrate is in contact with the electrode member in the presence of the liquid*, as recited in amended independent claims 23 and 25. Because the remaining Moore reference, Hafeman reference, and

Bernard reference also do not teach or suggest this feature, it is submitted that amended independent claims 23 and 25 are clearly patentable over the prior art of record.

Independent Claim 33

As illustrated in Figures 21A through 21D of the present application, amended independent claim 33 is directed to an electrolytic processing apparatus comprising an electrode section having an electrode member 282 including an electrode 286 and an ion exchanger 290 covering a surface of the electrode 286. In addition, *an insulator 292 is interposed between the ion exchanger 290 and the surface, facing the workpiece W, of the electrode 286* (see page 58, line 29 through page 59, line 5 of the specification).

As a result of the above-described arrangement, the electric field concentration on the substrate-facing surface of the electrode 286 can be eliminated so as to reduce the local accumulation of processing products. Furthermore, the insulator 292 requires that the substrate-facing surface of the electrode 286 be positioned farther from the substrate W. As a result of these features, the life of the ion exchanger 290 is increased (see page 18, lines 8-11 and page 59, lines 14-25 of the original specification).

In the outstanding Office Action, the Examiner asserted that the Olgado reference teaches an electrode member with an “ion exchanger” 2289 covering the surface of the electrode, but acknowledged that the Olgado reference does not teach an insulator interposed between such an ion exchanger and a surface of the workpiece. However, as explained in paragraph [0041] on page 4 of the Olgado reference, reference number 2289 identifies a hydrophilic membrane which is formed as a bag surrounding and enclosing anode 16. The hydrophilic membrane 2289 “filters out particulate matter from the electrolyte solution while permitting metal ions generated by anode 16 to be carried in the electrolyte solution to pass from the anode 16 to the substrate 221.” (See paragraph [0041]). Thus, the hydrophilic membrane 2289 is simply a *filter* for particulate matter but does not constitute an ion exchanger as recited in amended independent claim 33. Thus, although the Examiner asserted that the Hafeman reference teaches a semiconductor electrode with an insulator, it is submitted that, because the Olgado reference does not teach or even suggest *any* form of ion exchanger, there would be no reason provided by the Hafeman reference to modify the Olgado reference so as to result in the invention recited in amended independent claim 33. Furthermore, because the remaining references of record, including the

Bonga reference, the Moore reference, and the Bernard reference also do not teach or suggest the arrangement of the insulator between an ion exchanger and a surface of an electrode as recited in amended independent claim 33, it is submitted that amended independent claim 33 and the claims that depend therefrom are clearly patentable over the prior art of record.

Independent Claims 35 and 38

Amended independent claims 35 and 38 are each directed to an electrolytic processing apparatus that comprises an electrode section having an electrode member including an electrode and an ion exchanger covering a surface of the electrode. Furthermore, the ion exchanger comprises an ion exchanger to be close to or in contact with a workpiece and at least partly insulated from each other by an insulator.

As explained above with respect to amended independent claim 33, the hydrophilic membrane 2289 of the Olgado reference is not an ion exchanger. Thus, although the Hafeman reference and the Bernard reference might teach insulators, it is submitted that one of ordinary skill in the art would not be motivated by such references to obtain an electrolytic processing apparatus in which an electrode and an ion exchanger are at least partly insulated from each other by an insulator, as recited in amended independent claims 35 and 38. Accordingly, it is respectfully submitted that amended independent claims 35 and 38, as well as the claims that depend therefrom, are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

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